What is claimed is:

1. An imaging method including the following steps:

emitting at least two successive pulses along the same line of view into an object body;

receiving reflection (P1, P2) or matter excitation (MR1, MR2) signals, generated by the object body in response to said two pulses;

combining together said two response signals (P1, P2; MR1, MR2) and transforming the combined signal into image data related to the transmission view line of the pulses emitted into the object body, characterized in that the following steps are provided:

combining the response signals relating to the two successive pulses by a weight function (WEIGHT) which, by comparing corresponding samples of the two echo signals (P1, P2, MR1, MR2), assumes values in a range between a maximum value and a minimum value depending on the mutual correlation measure between said corresponding samples of the two signals;

combining the weight function thereby obtained with the combination of the two echo signals (P1, P2; MR1, MR2) and transforming the resulting signal into image data, i.e. image points (pixels, voxels).

2. A method as claimed in claim 1, characterized in that the weight function has two predetermined maximum and minimum values which are assumed when the corresponding components of the two successive response

signals (P1, P2; MR1, MR2) have equal or opposite signs (equal or opposite phases) respectively, whereas in case of partly unrelated signal samples, the function assumes intermediate values.

3. A method as claimed in claim 1 or 2, characterized in that the correlation weight function has a continuous development or is a function having discrete values depending on the occurrence of specific phase conditions.

4. A method as claimed in one or more of the preceding claims, characterized in that the response signals (P1, P2; MR1, MR2) are sampled before processing.

5. A method as claimed in one or more of the preceding claims, characterized in that the at least two successive response signals (P1, P2; MR1, MR2) related to the two successive identical pulses are filtered before being combined with each other and/or with the weight function and/or after being combined with each other and/or with the weight function.

6. A method as claimed in one or more of the preceding claims, characterized in that one or more signal amplitude thresholds (A, B) are determined, wherewith the two response signals (P1, P2; MR1, MR2) are compared, a threshold function being defined which assumes predetermined values depending on the response

signals (P1, P2; MR1, MR2) being above or below said one or more thresholds, said function being combined with the signal defined by the combination of the weight function and by the combination of the response signals (P1, P2; MR1, MR2).

7. A method as claimed in one or more of the preceding claims, characterized in that the weight function is an EXNOR function applied to the signs of the two successive response signals (P1, P2; MR1, MR2) and which assumes the value 0 when the two echo signals (P1, P2; MR1, MR2) have opposing phases and the value 1 when the two echo signals (P1, P2; MR1, MR2) are in-phase, whereas said function assumes intermediate values for any dephasing intervening between a 180° dephasing and the 0° phase.

8. A method as claimed in one or more of the preceding claims, characterized in that the weight function is further averaged based on a plurality of successive pairs of response signals (P1, P2; MR1, MR2) generated by a plurality of pairs of successively transmitted signals.

9. A method as claimed in one or more of the preceding claims, characterized in that the weight function is averaged by low-pass filtering.

10. A method as claimed in one or more of the preceding claims, characterized in that the weight function is averaged by integration.

11. A method as claimed in one or more of the preceding claims, characterized in that the threshold function is applied by accounting for the most significant N bits on the sampling vectors of the two received response signals (P1, P2; MR1, MR2).

12. A method as claimed in one or more of the preceding claims, characterized in that the threshold function is a NOR logic function and assumes the discrete values 0 and 1.

13. A method as claimed in one or more of the preceding claims, characterized in that the one or more thresholds are determined based on the most significant N and M bits of the two response signals P1, P2; MR1, MR2 being considered for the application of the threshold function.

14. A method as claimed in one or more of the preceding claims, characterized in that the threshold function is applied to two vectors P1", P2"; MR1", MR2" which represent the magnitude (abs function) of P1, P2; MR1, MR2. The threshold function has components 1 when the sampled vectors of the response signals (P1, P2; MR1, MR2) have, among the most significant N bits being considered in threshold determination, at least one bit

equal to 1, and has components 0 in any other case.

15. A method as claimed in one or more of the preceding claims, characterized in that the two response signals (P1, P2; MR1, MR2) related to the two successive identical pulses are combined together by addition or subtraction or multiplication or division or by a combination function.

16. A method as claimed in one or more of the preceding claims, characterized in that the magnitude of one the two response signals is only considered in the computation of the threshold function.

17. A method as claimed in one or more of the preceding claims, characterized in that the pulses transmitted to the object body are ultrasonic pulses, said method being provided in combination with a B Mode imaging technique, wherein the amplitude information of all echo signals (P1, P2) having the fundamental transmission frequency is used to determine the brightness of a corresponding pixel and the reception times are used to define the spatial position of pixels in the image corresponding to the line of view.

18. A method as claimed in one or more of the preceding claims 1 to 16, characterized in that the pulses transmitted to the object body are ultrasonic pulses, said method being provided in combination with ultrasound imaging methods which use echo signals

components at the second or higher harmonic of the fundamental transmission frequency (Harmonic Imaging).

19. A method as claimed in claim 18, characterized in that it is provided in combination with a Pulse Inversion imaging method, wherein one of the two successive transmission signals (P1, P2) is inverted in phase or sign.

20. A method as claimed in claim 18, characterized in that it is provided in combination with an imaging method, wherein subtraction is performed between the two received echoes (P1, P2).

21. A method as claimed in one or more of the preceding claims 17 to 20, characterized in that it includes the following steps:

emitting at least two successive ultrasonic pulses along the same line of view;

receiving the reflected signals (V1, V2) for said two pulses;

sampling said signals to provide two reception vectors (P1 and P2);

combining together said two signals (vectors) (P1, P2) and transforming the combined signal into image data related to the transmission line of view of the pulses emitted into the object body;

combining the echo signals relating to the two successive ultrasonic pulses by a weight function which, by comparing corresponding samples of the two

echo signals (P1, P2), assumes values in a range between a maximum value and a minimum value depending on the mutual correlation measure between said corresponding samples of the two signals; combining the weight function thereby obtained with the combination of the two echo signals (P1, P2) and transforming the resulting signal into image data, i.e. image points (pixels, voxels).

22. A method as claimed in one or more of the preceding claims 1 to 16, characterized in that the emitted pulses are electromagnetic excitation pulses for Nuclear Magnetic Resonance imaging, the received signals being electromagnetic pulses emitted by the matter when it relaxes from the excited state caused by said excitation pulses.

23. A method as claimed in claim 21, characterized in that it includes the following steps:

acquiring data with the normal procedure to form at least two images of the same section;

separating data into real part and imaginary part;

combining these data by a weight function which, by comparing respective samples or real and imaginary parts, assumes values in a range between a maximum value and a minimum value depending on the mutual correlation between said samples corresponding to the two response signals (MR1, MR2);

combining real and imaginary part data with the weight function

recomposing signals into real part and imaginary part;

reconstructing the image.

24. An imaging system for implementing the method as claimed in one or more of the preceding claims, comprising:

means for generating a succession of pulses and means for emitting said pulses towards the object body;

means for receiving the response signals deriving from emitted pulses;

means for processing the response signals and transforming them into image points related to the information contained in the response signal regarding their position and luminous intensity or color said set of points forming a linear, two-dimensional or three-dimensional image;

characterized in that it additionally comprises:

means for successively repeating at least once an identical pulse, to generate at least two successive related and theoretically identical response signals;

means (7, 13, 18) for weighting the received signals based on the mutual correlation of identical or corresponding components of the at least two response signals (P1, P2; MR1, MR2) corresponding to the at least two identical transmission pulses successively emitted along the same line of view.

25. An imaging system as claimed in claim 24, characterized in that it is a Nuclear Magnetic Resonance imaging system.

26. An imaging system as claimed in claim 24, characterized in that it is an ultrasound imaging system.

27. An ultrasound imaging system as claimed in claim 26, comprising:

at least one transducer for transforming electric signals into ultrasonic pulses, preferably a geometrically and numerically predetermined transducer array (1);

at least one receiving transducer, the same as the transmitting transducer or separate therefrom, preferably a geometrically and numerically predetermined receiving transducer array, which may be the same as the transmitting transducer array or separate therefrom (1);

means (2) for controlling the transmitting and receiving transducers (1) for alternate transmission and reception activation;

means (3) for focusing ultrasonic beams in a certain propagation direction, i.e. along a predetermined line of view by synchronized activation of the transmitting transducers, when a transmitting transducer array (1) is provided;

means (3) for focus reconstruction relative to the received echo signals, when a receiving transducer

array (1) is provided, by resettling synchronization relative to the signals received by the individual transducers;

means for sampling the received echo signals;

means (12) for combining together two successive received echo signals (12);

means for processing the received echo signals (P1, P2) to remove the undesired signal components;

means (9) for transforming the processed echo signals into image signals related to at least one point or one line of a three- o two-dimensional image formed by a set of points (pixels or voxels) or by a set of lines;

the means for processing the received echo signals to remove the undesired signal components comprising means (7, 13, 18) for weighting the received signals based on the mutual correlation of identical or corresponding components of two echo signals (P1, P2) corresponding to two identical transmission pulses successively emitted along the same line of view.

28. A system as claimed in claim 27, characterized in that the means for removing undesired signal components are provided in a processing chain parallel to the processing chain (12) designed for combining the two successive echo signals (P1, P2).

29. A system as claimed in claim 27 or 28, characterized in that there are provided means (16) for combining the output signals of the two parallel processing chains (12, 13, 14).

30. A system as claimed in one or more of the preceding claims 24 to 29, characterized in that the means for removing the undesired signal components (13) comprise, in the form of particular hardware or of programmable elements, a phase comparator and a logic circuit for executing logic interpretation functions on the phase comparator output, which provides a signal having predetermined levels depending on certain phase conditions between two echo signals (P1, P2) provided to the phase comparator.

31. A system as claimed in claim 30, characterized in that the logic circuit comprises means for executing a logic phase comparison function, e.g. EXNOR.

32. A system as claimed in one or more of the preceding claims 24 to 31, characterized in that the means (12) for combining echo signals (P1, P2) consist of a summer or subtractor, and/or multiplier and/or divider circuit.

33. A system as claimed in one or more of the preceding claims 24 to 32, characterized in that the output of the means (12) for combining echo signals (P1, P2) and the output of the means for removing the

undesired signal components (13) are connected to the inputs of a combination circuit (16).

34 . A system as claimed in claim 33, characterized in that the combination circuit is a multiplier (16).

35. A system as claimed in one or more of claims 24 to 34, characterized in that it provides passband filters in the form of depth adaptive filters or extraction filters.

36 . A system as claimed in one or more of the preceding claims 24 to 35, characterized in that at least one of the processing chains has a delay circuit (15) for time synchronization of the outputs of the individual processing chains.

37. A system as claimed in one or more of the preceding claims 24 to 36, characterized in that it additionally comprises a third parallel processing chain having a logic circuit (18) for determining thresholds, comparing them with each pair of echo signals (P1, P2) and determining an output signal having signal levels corresponding to predetermined relation conditions between the threshold/s and the echo signals (P1, P2).

38. A system as claimed in claim 37, characterized in that the circuit (18) of the third processing chain comprises a logic circuit for executing a threshold function, e.g. a NOR.

39. A system as claimed in claim 37 or 38, characterized in that it has means (20) for combining the output of the third processing chain (18) with the two additional chains respectively comprising the means (12) for combining the two echo signals (P1, P2) and the means (13) for removing the undesired components of echo signals (P1, P2).

40. A system as claimed in one or more of claims 37 to 39, characterized in that the means (20) for combining the third processing chain (18) consist of a signal multiplier.

41. A system as claimed in one or more of the preceding claims 37 to 40, characterized in that the means (20) for combining the third processing chain (18) with the two previous ones (12, 13) are provided downstream from the means (16) for combining the two processing chains (12, 12') designed for combining together the echo signals (P1, P2) and (13) for removing the undesired signal components.

42. An imaging system and method, wholly or partly as described, illustrated and for the purposes stated herein.